DEPARTMENT OF BIOMEDICAL ENGINEERING
INSTRUCTIONAL INCUBATOR
UNIVERSITY OF MICHIGAN

BME Course Summary

Introduction

1. Course Information

Course Name	*Introductory Biomedical Engineering Laboratory*
Institution	*University of Michigan*
Course Number	**BME 241**
# credits	**4**
Meeting times	**Lecture: Mon & Wed 13:30 – 14:30, Lab: Fri 8:30 – 12:30 (Sec 1) & 13:00 – 17:00 (Sec 2)**
Is this a required course?	**Yes**
Pre-requisites	**BIOMEDE 211 (Circuits and Systems), 221 (Biophysics, Chemisty, and Thermodynamics), and 231 (Introduction to Biomechanics)**
Target audience (e.g. 1st, 2nd year):	**2nd – 3rd year undergraduates**
Textbook	**Miller and Freund's Probability and Statistics for Engineers (8th Edition) by Richard Johnson, Irwin Miller, John Freund - SUGGESTED**
Course Website (if it exists)	**Canvas (I do not have access yet)**

2. Course Description

In the space below, "paste" the description of the course. This can be the actual description listed in the syllabus from the course.

This course provides an introduction to experimentation in circuits, systems, physical chemistry, thermodynamics, and mechanics with emphasis on biological applications. Lectures and laboratories on lab safety, measurement and analysis of physiological systems; operational amplifiers; rate of reaction; heat of reaction; whole body, tissue, and cellular mechanics; probability and statistical analysis.

3. Course Learning Objectives

In the space below, "paste" the course learning objectives if explicitly stated.

1. Learn how to use a function generator, pre-amplifier, and oscilloscope for circuit analysis.
2. Learn how to build basic circuits and characterize the function of commonly used circuit elements.
3. Learn how to use a materials testing system, prepare material and tissue samples, and characterize their mechanical properties.
4. Learn how to analyze and compare mechanical factors that influence biological function on the cellular, tissue, and whole body scale.
5. Learn how to develop a hypothesis, design and experiment testing the hypothesis, and draw conclusions based on the results.
6. Learn how to process experimental data for quantitative analysis.
7. Enhance communication skills through formal reports and poster presentations.

4. Fundamental Tools and Skills

In the space below, describe the fundamental tools and skills that are addressed in the class. For example, labvview, arduino's, the design process etc.

Circuitry and circuit materials, LabVIEW, electromyography sensors, cell culture tools, probability and descriptive statistics, hypothesis formation and testing, lab notebook culture.

5. Exercises or Experiential Projects of Interest

Exercise/Project	**Project Overview**	**Learning Activities and Assessments**	**Required Resources for Project Completion**
EXAMPLE	Students make pulse	**Learning Activities**	Function generator, resistors, oscilloscope….

Exercise/Project	Project Overview	Learning Activities and Assessments	Required Resources for Project Completion
	oximeters.	• Students will use resistors and a bread board to … • In a short essay assignment, students explain… **Assessment** • Students complete a laboratory report that explains …	
1 Lab 4: EMG	Students build an EMG signal processing circuit and verify heart signals.	**DATA UNAVAILABLE**	
2 Lab 8: Flexture Testing		**Cindy has been out of the country (in Israel) for a while and has not been able to deliver this information to me as of yet, nor is this information available online in any way.**	

6. Additional thoughts

If you have any other thoughts about this course, but have not been able to reflect it elsewhere in the document, please feel free to do so here.

This course covers so many interesting things. I wish I could have taken such as an undergrad!